

Book review

The Biomedical Engineering Handbook, Part I–III, third ed., Joseph D. Bronzino (Ed.). CRC Press, Taylor & Francis Group (2006). \$ 219.95, ISBN: 0-8493-2121-2, 0-8493-2122-0, 0-8493-2123-9

The present book can be considered as an encyclopedia in the field of biomedical engineering. Coming from the basic research-oriented activities closely related to biotechnology and genetic engineering it describes numerous aspects in the world of biomedical engineering. Overall it covers a complex field ranging from medical imaging, biomaterials, biomedical instrumentation to medical and biological analysis. These different fields are captured in about 250 review type chapters each typically 10–25 pages long.

The handbook is divided into three separate books, an expansion compared to the previous second edition. The chapters have been thoroughly revised and updated compared the forerunner and several completely new sections have been added according to new developments in the field. Book I covers biomedical engineering fundamentals. It starts with physiology and moves via bioelectric phenomena, biomaterials and biomechanics to human performance engineering, not mentioning all sections. Within each section the different chapters go into detail on the various aspects. E.g. the broad field of biomechanics differs widely between hard tissue, soft tissue, cardiac biomechanics or cellular biomechanics. All the chapters I went through are well written reviews. It is certainly difficult to cross-reference between the chapters within such an

enormous opus. Here the index helps, but I wished the index would be even more detailed and comprehensive. Part II, medical devices and systems, contains eight sections on biomedical signal analysis, imaging, infrared imaging, medical informatics, biomedical sensors, medical instruments and devices, clinical engineering and finishes with a section on ethical issues, a section which closes every book. Part III, tissue engineering and artificial organs, touches the surface of molecular biology before laying the foundation for tissue engineering and artificial organs by reviewing transport phenomena, biotechnology and bionanotechnology in more detail. Subsequently, a wealth of different aspects of tissue engineering based on different tissues, cells and biomaterials as well as prostheses and artificial organs are described.

The handbook provides a wonderful encyclopedic overview of the field of biomedical engineering. With this respect it is on the one hand a high quality work to get started with in the field but on the other hand a comprehensive reference book for experienced scientists. I would not want to miss it in my library.

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